

Proceedings of
2nd National Conference on
Current & Emerging Process Technologies
25th January - 2019

CONCEPT-2019



Department of Chemical Engineering

In Association with

Indian Institute of Chemical Engineers
KEC Student Chapter



Kongu Engineering College
(Autonomous)

Perundurai, Erode - 638 060. Tamilnadu.



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2nd National Conference on Current & Emerging Process Technologies

CONCEPT – 2019

SUSTAINABLE TECHNOLOGY & PROSPERITY

January 25, 2019



KONGU ENGINEERING COLLEGE

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade

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Transform Yourself

A. VENKATACHALAM B.Sc.,
CORRESPONDENT

MESSAGE

I feel very glad to note that IIChE – KEC Student Chapter and Department of Chemical Engineering, Kongu Engineering College is organizing its 2nd National Conference on Current & Emerging Process Technologies 'CONCEPT-2019' on 25th January, 2019.



The Department of Chemical Engineering excels in research by addressing the needs of phenomenally growing Chemical Industries. I am confident that this technical conference will serve as an ideal platform for the faculty / student of chemical and related disciplines to exchange their ideas and views. It will also help them to upgrade their knowledge in recent developments.

I congratulate the faculty and the student of Chemical Engineering for undertaking this endeavour.

I wish this event a grand success.

A. Venkatachalam
22/1/19
CORRESPONDENT

Phone : 04294 - 226555, 222181 Fax : 04294 - 220087 Mobile : 98652 13077
Website : www.kongu.ac.in





2nd National Conference on Current & Emerging Process Technologies

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KONGU ENGINEERING COLLEGE

(Autonomous)

THOPPUPALAYAM (PO) PERUNDURAI - 638 060 ERODE (Dt)

TAMILNADU INDIA

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)



Prof. S. KUPPUSWAMI

B.E., M.Sc.Engg., Dr.Ing.(France)

PRINCIPAL

MESSAGE

I am delighted to learn that IIChE – KEC Student Chapter and Department of Chemical Engineering, Kongu Engineering College is organizing its 2nd National Conference on Current & Emerging Process Technologies 'CONCEPT-2019' on 25th January, 2019.

The field of Chemical Engineering and related disciplines has evolved to meet the challenges in the industries and society. It is important to expose the budding engineers to the recent developments in this field. This conference provides a platform for academicians / students across the nation to interact with each other and to share their knowledge.

I congratulate the faculty and the student of Chemical Engineering Department for their hard work in organizing this event

I wish CONCEPT – 2019 a grand success.



S. Kuppuswami
25/1/19
PRINCIPAL

Phone : +91 - 4294 - 226511 (P) +91 - 4294 - 220583 (O) +91 - 4294 - 220630 (R)

Mobile : 99428 20583 Fax : +91 - 4294 - 220087

E-mail : principal@kongu.ac.in skswami@kongu.ac.in Website : www.kongu.ac.in





KONGU ENGINEERING COLLEGE

(Affiliated to Anna University, Chennai)

Perundurai, Erode - 638 052. Tamilnadu, INDIA.



Dr. K. SARAVANAN, M.Tech., Ph.D., (Tech)

D.H.R.M., D.I. Safety, P.G.D.B.I.,

Professor & Head

Department of Chemical Engineering

Telephone : 91 - 4294 - 226600 (O)

: 91 - 4294 - 225797 (R)

Fax : 91 - 4294 - 226600

e-mail : saran@kongu.ac.in

rumisivaesh@yahoo.com

Website : www.kongu.ac.in



HOD MESSAGE



Innovations, inventions and subsequent developments in various fields of science and technology paved the way to the sophisticated life we live. However, each and every technology has its own inherent merits and demerits which need to be addressed at times. CONCEPT – 2019: National Conference on Current & Emerging Process Technologies is the second edition of the National Conference, organized by the Department of Chemical Engineering and IIChE – KEC Student Chapter, which provides a platform to exchange and update the significant developments taken place in the fields of modern science and technology and to discuss the issues and challenges thereof.

I am pleased to be a part of the conference CONCEPT – 2019. I am thankful to the faculty, staff and students who made this function a remarkable one.


Head of the Department



ABOUT THE INSTITUTE

Kongu Engineering College (KEC) was established in the year 1984. Approved by AICTE, New Delhi and affiliated to Anna University, Chennai. The Institution has completed 34 years of dedicated and excellent service in the field of technical education. The Institution offers 14 UG, 19 PG and 16 Research programmes in Engineering, Applied Sciences and Management branches. The Institution is one among the best self-financing engineering colleges imparting high quality technical education in Tamil Nadu and is rated 3rd among all self-financing colleges in India and 46th among all Engineering Colleges including IITs & NITs in India by MHRD & NIRF. The Institution has got NBA accreditation for all UG programme and is also ISO certified. It has also got the Best Engineering College award and the Best Principal Award. The Technology Business Incubator was established in the Institution with sponsorship from DST.

ABOUT THE DEPARTMENT

The Department of Chemical Engineering was started in the academic year 1994 -1995 and offers B.Tech., and M.Tech., Degree programmes in Chemical Engineering. This department is one of the recognized research centers by the Anna University, Chennai. Well-equipped laboratories with advanced simulation software's like ASPEN, HYSYS, HTRI, gPROM and ProSIM's cater to the interests of aspiring students. The department focuses on imparting students with excellent technical knowledge to meet the needs of industries and research as well. The Indian Institute of Chemical Engineers Student Chapter, Kongu Engineering College started in the year 2001 aims to promote advancement of Chemical Engineering Science among the students and professionals.

ABOUT IIChE

Indian Institute of Chemical Engineers was born just before the Indian Independence during the days fomenting with nationalistic inspirations. Dr Hira Lal Roy, the great visionary and pioneer of chemical engineering in India, along with few other stalwarts felt the need for such a forum within the country to rear the nascent initiatives for spread of chemical engineering education and foster the interest of the profession. A modest beginning was made on 18 May 1947 in a room of Jadavpur University, Kolkata, with 30 members, little fund and nominal infrastructure. Today, around 15,000 members are on its roll, the Institute has emerged as the apex professional body of chemical engineering professionals in India. The objectives of the Institute within their respective territorial limits, by organizing meetings, conferences and seminars; arranging workshops, refresher courses and counseling sessions; promoting research; guiding chemical engineering students in career planning; and initiating any other activities which are of social, technical and professional relevance to their members.



ABOUT THE CONFERENCE

The continuous growth in population and the rapid industrialization lead to the degradation of the quality of the environment to a noticeable extent and the prominent change in The National Conference on Current & Emerging Process Technologies CONCEPT-2019 aims at bringing together the leading academic scientists, industrial persons, researchers and UG, PG students of AICTE approved Engineering colleges and UGC approved Arts & Science and pharmacy colleges to exchange and share their experiences and research outcomes in the aspects of emerging and advanced process technologies.

Our Major Domains are

- | | |
|---|---|
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| 4. Chemical Process Technology & Safety | 12. Waste Water Treatment, Reuse & Recycle |
| 5. Renewable Energy | 13. Metallurgy & Material Technology |
| 6. Green Chemistry | 14. Process Modelling, Simulation & Optimization |
| 7. Nanotechnology | 15. Others - include advances in science , |
| 8. Food & Nutrition | engineering and technology |

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AGENDA

Venue : Maharaja Auditorium

Date : 25/01/2019

09.30am-09.35am	PRAYER SONG
09.35am-09.40am	LIGHTING THE KUTHUVILAKU
09.40am-09.45am	WELCOME ADDRESS Dr. K.Saravanan M.Tech.,Ph.D.(Tech) Professor & HOD/Chemical
09.45am-09.50am	PRINCIPAL ADDRESS Prof.S.Kuppuswami B.E., M.Sc(Engg)., Dr. Ing (France) FIE Principal, Kongu Engineering College
09.50am-09.55am	PRESIDENTIAL ADDRESS Thiru.A.Venkatachalam, B.Sc., Correspondent, Kongu Engineering College
09.55am-10.05am	INTRODUCTION OF CHIEF GUEST
10.05am-10.10am	HONOURING THE CHIEF GUEST
10.10am-10.20am	CHIEF GUEST ADDRESS Dr. C. Karthikeyan M.Tech.,Ph.D. IIChE Former Vice President, Prof. & Head Dept.of Chemical Engineering Annamalai University-Chidambaram. Dr. M. Rajasimman M.Tech.,Ph.D. IIChE Hony. COE & Asso.Prof. Dept.of Chemical Engineering Annamalai University-Chidambaram.
10.20am-10.25am	RELEASE OF THE CONFERENCE PROCEEDINGS
10.30am-01.00pm	TECHNICAL SESSIONS
01:00pm-01:45pm	LUNCH
01:45pm-04:00pm	TECHNICAL SESSIONS
04:00pm-04:30pm	VALEDICTORY



INVITED SPEAKERS



Prof. C. Karthikeyan M.Tech.,Ph.D.
IIChE Former Vice President
Prof. & Head Dept.of Chemical Engineering
Annamalai University, Chidambaram.

Prof. C.Karthikeyan is Professor and Head, Department of Chemical Engineering, Annamalai University. He obtained B.E.(Chem) from Annamalai university in 1988, M.Tech at Jadavpur University in 1991 and Ph.D in 2001 from Annamalai University. He joined as lecturer in Annamalai University in 1991 and elevated to Professor in 2004. He has twenty seven years of teaching and research experiences. He has guided six Ph.D and thirty one M.Tech students. To his credit he has more than 40 publications in International and National journals. His research areas are Environmental Biotechnology, Food Technology and Nanotechnology. He has served as a member in Board of Studies of Anna University, Bharathidasan University, JNTU Ananthapur and Periyar Maniyammai University. He is Life Member in IIChE and ISTE. He has served as Chairman in IIChE Annamalai Neyveli Regional centre. He was elected as a national Council Member of IIChE in 2015-17. He was Controller of Examination, IIChE in 2015 and Vice-President, IIChE in 2017.



INVITED SPEAKERS



Dr. M. Rajasimman M.Tech.,Ph.D.

IICChE Hony. COE

Associate Professor, Dept.of Chemical Engineering
Annamalai University, Chidambaram.

Dr. M. Rajasimman is currently an Associate Professor (since July 2010) in the Department of Chemical Engineering at Annamalai University, Annamalai Nagar, Tamilnadu. He joined as a Lecturer in the Department of Chemical Engineering in March 1998. He earned his doctorate in Chemical Engineering from Annamalai University, in January 2007. His research concentrated on the treatment of industrial effluent in an inverse fluidized bed bioreactor. He has also worked on adsorption, sequential batch reactor. He is recipient of awards such as Best Researcher award (for Publication) 2017 by Annamalai University, Young Researcher Award 2018 by Annamalai University. His h-index of 21 (i-10 index of 42, total citations exceeding 1250, Source: Google Scholar, January, 2019), strongly endorses his high research productivity. He has published over 94 articles in the peer-reviewed International journals and presented more than 40 papers in various International / National Conferences. His research interests include adsorption, wastewater treatment, bioreactors, optimization and nano composite materials. So far, he has guided 6 Ph.D research scholars and currently guiding 4 scholars. Currently, he is reviewer of over 20 technical journals from Elsevier, Wiley, Springer, Hindawi, ACS Publications etc. He was also an Associate Editor in the International Journals, International Journal of Chemical Technology, Journal of Environmental Science and Technology, Research Journal of Environmental Sciences during the period 2012-2015. He is also a National council member in the Professional body of Indian Institute of Chemical Engineers (IIChE) for the year 2017-2019.



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ORAL PRESENTATIONS

ASTO101

EXTRACTION OF ASCORBIC ACID AND CAROTENIODS FROM PASSIFLORA EDULIS

Ebin John¹, Sathya.T², Sreenivasan.D³

^{1,2} UG Scholar, Department of Chemical Engineering, Paavai Engineering College

³ Assistant Professor, Department of Chemical Engineering, Paavai Engineering College

Email: ebinkuriyil@gmail.com, sathyakavin33@gmail.com, sreenin@live.com

Abstract

Researches carried out over the years have demonstrated the growing interest in recovering phytochemicals from vegetal matrices. The main goal of this work is to recover carotenoid and ascorbic acid from passiflora edulis (passion fruit). About 7 to 9 % of Carotenoid and 34 to 36% ascorbic acid can be obtained from 100gms of seed and peel extract of passiflora edulis. Carotenoid (zeta-carotene, Prolycopene, Violaxanthin, beta cryptoxanthin, Beta and alpha carotene) are the major phytochemicals which has the biological activity to inhibit oxidation (antioxidant) and can be used as anticancer drug. The motivation of this theme is based on complete extraction of carotenoid and ascorbic acid from seed and peel. The recovery of carotenoid can be done by the Eco-friendly solvent extraction technique, such as soxhlet extractor is utilized. The main advantage of this work is that the solvent can be recycled. The carotenoid and ascorbic acid can be used as the supplementary for anticancer drugs in a lower cost than existing drugs and also by finding the mass transfer coefficient of this extract we can able to find the extraction efficiency and also identify which solvent can provide maximum extract and this will help for further research purposes.

Keywords: Carotenoid, Ascorbic acid, Passiflora edulis, Solid- Liquid extraction.

BCEO102

PARAMETRIC STUDY OF SOLVENT ASSISTED EXTRACTION ON DPPH RADICAL SCAVENGING ACTIVITY OF OIL RECOVERY PROCESS FROM CORIANDER SEEDS

Jeeva Senrayan¹ and Sivakumar Venkatachalam^{2*}

^{1,2*} Food Process Engineering Lab, Department of Chemical Engineering, A C Tech Campus, Anna University, Chennai -600 025. *Corresponding author: Sivakumar Venkatachalam

Email: jeevaasenrayan@gmail.com, jeevasenrayan@aukdc.edu.in

Abstract

Solvent assisted extraction technique was applied to extract the vegetable oil from coriander seeds. The effect of extraction process variables on DPPH radical scavenging activity of oil was investigated. The optimal condition for solvent assisted extraction was determined by Response surface methodology. Face centered-Central composite design was applied to evaluate the effects of three independent variables (solid solvent ratio, temperature and time) on 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity of coriander seed oil. The correlation analysis of mathematical-regression model indicated that quadratic polynomial model could be employed to optimize the solvent assisted extraction. Multiple regression analysis was done on the experimental data to develop second-order polynomial models with high coefficient of determination value ($R^2 \geq 0.95$). 3D response plots were generated to study the interaction

process variable effects on antioxidant activity of oil. Desirability function was utilised for numerical optimization for strong scavenging activity. The extracts obtained by optimised condition procedure exhibit significant antioxidant activity and can be used as a natural source of antioxidants.

Keywords: *Solvent assisted extraction, Vegetable oil, DPPH radical scavenging activity, Optimization, RSM.*

BCEO103

INFLUENCE OF TEMPERATURE, pH, INCUBATION TIME, METAL IONS ON AMYLASES PRODUCTION FROM BACILLUS SPECIES FOR BIO-DESIZING

R.Kavitha¹

¹Lecturer in the Department of Textile Technology, Federal Technical and Vocational Education and Training Institute, Addis Ababa, Ethiopia. Email: kavirajan.85@gmail.com

Abstract

In Textile Processing the Enzymatic removal of starch sizes from woven fabrics has been in use for most of this century and the fermentation vat is probably the oldest known dyeing process. Bioprocessing also offers the potential for new industrial processes that require less energy and are based on renewable raw materials. Various applications which entail enzyme and colours broadly included fading of denim and non-denim, bio-scouring, bio-polishing, silk degumming, carbonizing of wool, peroxide removal, washing of reactive dyes, etc. Incidentally enzymes were consumed to the tune of about 70% in detergents than in textile industry. Enzymes are large protein molecules made up of long chain amino acids which are produced by living cells in plants, animals and microorganism. Enzymes are secretions of living organisms, which catalyse biochemical reactions. Enzymes are biocatalysts without which no life in plant or animal kingdom can be sustained. Today enzymes have become an integral part of the textile processing. Amylases are hydrolase class of enzymes, which hydrolyse 1-4 α glucosidic linkage of amylose and amylopectin of starch to convert them into soluble dextrans. Amylase production from *Bacillus* species are of great industrial importance in the production of corn syrup or dextrose. The present study is aimed to determine the influence of temperature, pH, incubation time, metal ions on stability of α -amylase from *Bacillus* species. This present study is expected to give the outcome that enzyme may more stable at pH 6.0 than other pH values (7.0 and 8.0) The bacterium could grow satisfactory at all temperatures tested but the maximal amylase activity in the growth medium was achieved at 37°C. The maximum amylase production may be observed at an incubation period of 24 hrs for *Bacillus* species. The presence of calcium chloride may in the nutrient medium induces amylase production followed by CuSO₄ and MgSO₄. All α -amylases are metallo enzymes containing at least one Ca²⁺ ion per enzyme molecule which is essential for activity.

Keywords: *Enzyme, Amylase, Bacillus species, Bio Textiles.*

BCEO104

**AQUEOUS SOLUBILITY ENHANCEMENT OF NARINGENIN A
BIOACTIVE COMPOUND USING AN ECO-FRIENDLY HYDROTROPIC
PHENOMENON**

Praveen P¹, Vasanth Kumar E², Nagendra Gandhi N^{3*}

^{1,2} Department of Chemical Engineering, A.C.Tech, Anna University, Chennai-600025

³ Department of Chemical Engineering, A.C.Tech, Anna University, (Corresponding Author)

Email: praveaims@gmail.com, vippiv44@gmail.com, nagendragandhi.n@gmail.com

Abstract

Natural products from plant sources are widely used in medicinal fields. Naringenin is a flavonone derived from citrus fruits and grape fruits, has many biological effects such as antioxidant, anti-inflammatory, anticancer, antifibrogenic, antiandrogenic and free radical scavenger. On other hand naringenin is poorly soluble in water. Since it is poorly soluble in water it is not efficiently consumed. Hence, the aim of this study is to enhance the solubility of naringenin using hydrotropes such as citric acid, potassium acetate and nicotinamide and to find the thermodynamic parameters such as gibbs free energy, enthalpy and entropy. Solubility enhancement is confirmed by UV-Vis spectrophotometer and it is found that the aqueous solubility is enhanced by several folds when using potassium acetate as hydrotrope. The obtained thermodynamic parameters proved that, the hydrotropic aggregation is favoured entropically.

Keywords: Naringenin, Hydrotropes, Aqueous solubility, Thermodynamic parameters.

BCEO105

**EXTRACTION OF BIODIESEL FROM MIXTURE OF NUTS AND
CHARACTERIZATION OF PRODUCED BIODIESEL**

Bhuvanesh.R¹, Dhilipkumar.C², Muhamad Ashraf.S³, Vijay.R⁴

^{1,2,3,4} UG Scholar, Department of Chemical Engineering, Paavai Engineering College

Abstract

Due to the concern on the availability of recoverable fossil fuel reserves and the environmental problems caused by the use those fossil fuels, considerable attention has been given to biodiesel production as an alternative to diesel. This has resulted in environmentally friendlier alternatives which allow obtaining energy from nonconventional and renewable energy sources with a similar efficiency output. In current trend alternative fuel can be produced in different sources like vegetable oil, animal fats and algae. It shows the greatest energy potential and will be the main topic in this work. Basically vegetable oil contains triglycerides and it can be undergo into chemical process to change alternative fuels. When transesterification process involved to change chemical bonds in triglycerides and to production biodiesel. In project mainly focused to extraction of oil by using hexane solvent and it can undergo in the transesterification process with alkaline catalyst. In different composition ratio maintain in mixture of seeds to extraction of lipid content. Mixed seed oil has a wide variety of fatty acid composition, depending on their ratio. The produced Biodiesel will be purified and characterized by GC-MS and ASTM standard analysis respectively.

Keywords: Extraction, Triglycerides, Transesterification, Lipid content, Column Chromatography

BCEO106

**NOVEL STUDY OF ESSENTIAL ANISE OIL FROM STAR ANISE
(*ILLICIUM VERUM*)**

Krishnamoorthi.M¹, Mohammed shaijal babu², Harinisri.M³, Sreenivasan.D⁴

^{1,2,3} UG Scholar, Department of Chemical Engineering, Paavai Engineering College

⁴ Assistant Professor, Department of Chemical Engineering, Paavai Engineering College

Email: krishnamoorthi.m.98@gmail.com, harinimaruthanayagam23@gmail.com

Abstract

Anise is a member of Schisandraceae family originates from Asian countries. The essential oil is extracted from the aniseed and anise also. Extraction of Oil from Aniseed and anise was performed by using Steam Distillation Method. Anise Oil was playing roles in majorly medicinal and flavouring purposes, alcoholic and non- alcoholic beverages. The analysis of Chemical composition was done by Chromatography and Physical analysis of Anise Oil such as saponification value, specific gravity, acid value, iodine value, etc. was done in the laboratory. The yield of Anise Oil obtained from the steam Distillation process was varied with temperature, Time and quantities of raw material. The effective separation of essential oil from this process obtained in 65-75°C temperature.

Keywords: *star anise, essential oil, steam distillation, chromatography*

BCEO107

**PRODUCTION OF BIOPESTICIDES FROM CUSTARD APPLE AND
NEEM SEEDS**

Siva.M¹, Naveenkumar.M², Vivek.S³

^{1,2,3} UG Scholar, Department of Chemical Engineering, Paavai Engineering College

Email: sivamc98@gmail.com, mnnavvenkumar9908@gmail.com

Abstract

Most of the conventional pesticides affect the humans, environmental and it also shows its effect on soil for reducing the nutrients. To overcome these problems bio pesticides have been used for protecting the plants from the action of insects. Custard apple and Neem seeds we generally used as bio pesticides. In this present work, custard apple (*Annona squamosa*) and Neem (*Azadirachta Indica A. Juss*) seeds are blended to improve the bio pesticide activity. The blended oil is more suitable for all the common pest to protect crops. The oil is extracted from these seeds using solvents like n-hexane or methanol and etc. The various concentration oil solution is prepared by mixing with labolene soap solution. The produced and blended oil is compared and analysed for pesticide ingredient on the basis of gas chromatography test. Physical and chemical properties of the oil will also be tested and compared studies on formulation, improvement of properties of oil will also be done

Keywords: *Custard apple, Neem seeds, Extraction, n-Hexane, Methanol, Blended oil*

BCEO108

EMULSION LIQUID MEMBRANE

R.Sanjitha¹, M.Sandhiya², P.Nirmal kumar³, S.Naresh⁴, P.Manjula⁵

^{1,2,3,4} UG Scholar, Department of Chemical Engineering, Kongu Engineering College

Email: rsanjukrish@gmail.com

Abstract

The extraction efficiency of hexavalent chromium, Cr (VI), from water has been investigated using a vegetable oil-based emulsion liquid membrane (ELM) technique. The main purpose of this study was to create a novel ELM formulation by choosing a more environmentally friendly and non-toxic diluent such as Pine oil. The membrane phase so formulated includes the mobile carrier tri-n-octylmethylammonium chloride (TOMAC), to facilitate the metal transport, and the hydrophilic surfactant Tween 80 to facilitate the dispersion of the ELM phase in the aqueous solution. Span 80 is used as surfactant and butanol as co-surfactant. Our results demonstrate that this novel ELM formulation, using the vegetable Pine oil as diluent, is useful for the removal of hexavalent chromium with an efficiency of over 99% and is thus competitive with the already existing, yet less environmentally friendly, ELM formulations. This result was achieved with an optimal concentration of 0.1 M NaOH as stripping agent and an external phase pH of 0.5. Different water qualities have also been investigated showing that the type of water (deionized, distilled, or tap water) does not significantly influence the extraction rate.

Keywords: *emulsion liquid membrane (ELM); Pine oil; hexavalent chromium; ionic liquid; green chemistry*

BCEO109

**DIABETIC FOOT PLANTAR PRESSURE REGION MEASUREMENT
SYSTEM**

S. Agathiya, S. Akila, S. Dharani

Email: agathiyasivakumar@gmail.com

Abstract

The main purpose of the project was to develop a plantar sensor system which can be used to capture human sole (plantar) pressure during the loaded phase of gait accurately. The known factors for causing the development of plantar pain, strain and ulcer were unusual high peak plantar pressure, high plantar pressure gradient and high plantar accurate value during the support phase of gait. Precise pressure data is crucial in the monitoring and treatment of these illnesses. In this investigation, off-the-shelf pressure thin-sheet sensor pads were assembled, calibrated and tested for the acquisition of pressure data. Test results show that the low-cost system is suitable for high-quality pressure data acquisition. Therefore, low-cost thin-sheet pressure pads can be used to assemble large precise pressure sensing system for many applications such as in health and industry.

Keywords: *Precise, pressure, crucial, gait, accurately*

CPTSO101

STUDIES AND KINETIC ASPECTS

Venkatesa Prabhu S¹, Ararsa Tessema A¹, Shiferaw A¹, Gebeyanesh E¹ and Samraj S²

¹Department of Chemical Engineering, College of Biological & Chemical Engineering, Addis Ababa Science & Technology University, Ethiopia.

²Department of Petroleum Engineering, Easa College of Engineering & Technology, Coimbatore, Tamil Nadu, India.

Email:haiitsvp@gmail.com

Abstract

Recently, great interest has been shown for treating industrial sludge by alkaline leaching for selective recovery of copper (Cu). This novel approach overcomes the different environmental risks when compare to traditional acid leaching method. In the present study, waste sludge (ES) obtained from Bishoftu Automotive Engineering Industry, Ethiopia has looked at for selective leaching of Cu and its leaching kinetics using the alkali reagent, ammonium nitrate (AN). The effect of important parameters such as concentration of AN solution (1, 2, 3, 4 and 5 M) and temperature (15, 25, 35, 45, and 55 deg C) on Cu leaching was examined. The results explicated that the leaching increases with increasing concentration of the reagent solution and temperature. The values of leaching rate were calculated to be 0.001, 0.0012, 0.0014, 0.0019, and 0.002 min⁻¹ for the concentrations of 1, 2, 3, 4 and 5 M of AN, respectively. The values of leaching rate were calculated to be 0.0008, 0.0011, 0.0016, 0.002, and 0.0021, min⁻¹ for the experiment conducted at the temperatures respectively, 15, 25, 35, 45, and 55 deg C. The kinetic analysis revealed that leaching rate increases with increasing concentration of reagent solution and also identified that the chemical reaction controls rate of leaching. Using the Arrhenius equation, the activation energy for the Cu leaching from the ES reaction was calculated to be 31.85 kJ/mol.

Keywords: *Electroplating sludge, ammonium nitrate, copper, leaching, rate kinetics, shirking core model*

CPTSO102

EXPERIMENTAL INVESTIGATION ON THE PERFORMANCE AND EMISSION CHARACTERISTICS OF LEMON GRASS OIL METHYL ESTER AND ITS BLENDS IN SINGLE CYLINDER DIESEL ENGINE

V. Dinesh Kumar¹, M. Chinnapandian², N. Manoharan³

¹Ph.D scholar, Department of Mechanical Engineering, AMET University,²Professor and Head, Department of Aeronautical Engineering, St. Peter's College of Engineering and Technology,³Co-Vice Chancellor, AMET University, Chennai Email: jv.dhinesh@yahoo.com

Abstract

The Sustainable development of a country depends on its own resources in meeting their energy need. The increase in environmental pollution caused by the use of conventional petroleum fossil fuel has led to search of environment friendly and easily renewable fuels. This experimental work investigates the performance and emission characteristics of lime grass oil (LGOME) and its blends under different loading conditions from no load to full load in the incremental of 20% and the engine speed is maintained constant as 1500 rpm for all the fuel and its blends. The lemon grass oil is derived from the lemon grass by the steam distillation process and is then esterified. From the result it is observed that the lemon grass oil methyl ester

(LGOME) resulted in better brake specific fuel consumption at increasing load conditions, lower exhaust gas temperature with lower rate of nitrous oxide emission at all the load conditions than the diesel fuel.

Keywords: *performance and emission characteristics, steam distillation, esterification and lemon grass oil methyl ester (LGOME)*

CPTSO103

MASS TRANSFER STUDIES IN STIRRED FLUIDIZED BED

N.Deepa Priya¹, Dr.K.Saravanan², Basil Thampi³, A.Kesavan⁴, P.Kathirvel⁵

¹Assistant Professor, Department of Chemical Engineering, Kongu Engineering College

²Professor, Department of Chemical Engineering, Kongu Engineering College

^{3,4,5} UG Scholar, Department of Chemical Engineering, Kongu Engineering College

Email: dppriya1984@gmail.com

Abstract

Fluidized beds have unique ability to move a wide range of solid particles in a fluid like fashion. They offer excellent heat and mass transfer and are able to process materials with a wide particle size distribution. Effective fluidization is required for ensuring gas-solid contact, excellent heat and mass transfer. But it is tough to maintain smooth fluidization in case of cohesive particles, due to agglomeration of particles. Aeration of bed can give enhanced fluidization but too much aeration leads to bubble formation and slugging. So along with aeration, mechanical stirring was introduced to fluidized beds aiming better fluidization performance. Stirring increases bed bulk density reduces minimum fluidization velocity and porosity. Stirred fluidized bed employs an external agency such as stirrer to agitate the fluid. Stirring along with aeration increases the mass & heat transfer rates, also rapid mixing allows uniformity in stirred fluidized beds. The present study is directed to analyse the mass transfer coefficient by varying air flow rate, bed height and stirrer speed in the stirred fluidized bed using air-water system.

Keywords: *Stirred fluidized bed, mass transfer studies, Air Flow rate, Bed height, Stirrer speed.*

CPTSO104

SOLUBILITY STUDIES IN MULTI-COMPONENT SYSTEM

C.Gomadurai¹, L.Dharani²

¹Associate Professor, Department of Chemical Engineering, (Corresponding Author)

²PG Scholar, Department of Chemical Engineering, Kongu Engineering College, Erode.

Email:cgomadurai@gmail.com,dharaniloganathan95@gmail.com

Abstract

Studies on solubility of two or more solutes in single/mixed solvents find wide range of applications in pharmaceutical industries. The objective of the present work is to study the solubility of binary solute system. The effects of temperature and concentration of first solute on the solubility of second solute were investigated. Sodium Chloride (NaCl) and Potassium Chloride (KCl) were the two solutes used in the study. Solubility studies were carried out at three different temperatures namely 30, 40 and 50 °C respectively. Saturated solution of first solute was used in addition to its concentration on weight percentage from 10 to 30%. It was observed that the solubility of single solute increased with increase in temperature. It was also noticed that the dissolution of second solute influenced the solubility of the first solute. The results also showed that irrespective of the number of solutes present in a solution, the solubility increased with increase

in temperature. The thermodynamic parameters like the change in enthalpy, entropy and Gibb's free energy were experimentally found and the effect of the parameters on the solubility of second solute in saturated solution was studied.

Keywords: *Solubility, Saturated solution, Thermodynamic parameters, second solute, multi-component system*

CPTSO105

OSMOTIC DEHYDRATION OF PEAR IN SALT SOLUTION

Manivannan.P¹, Rajasimman.M^{2*}

¹Annamalai University, ²Annamalai University (Corresponding Author)

Email:manivannanpetchi@yahoo.com, mrsimman@yahoo.com

Abstract

In this work, osmotic dehydration of pear was carried out using salt solution. Response surface methodology was used for quantitative investigation of water and solids transfer during osmotic dehydration of Pear in aqueous solution of salt. Effects of temperature (25 – 45°C), processing time (30–150 min), salt concentration (5–25%, w/w) and solution to sample ratio (5:1 – 25:1) on osmotic dehydration of pear were estimated. Quadratic regression equations describing the effects of these factors on the water loss and solids gain were developed. It was found that effects of temperature and salt concentrations were more significant on the water loss than the effects of processing time and solution to sample ratio. As for solids gain, processing time and salt concentration were the most significant factors. The osmotic dehydration process was optimized for water loss, solute gain, and weight reduction. The optimum conditions were found to be: temperature – 35°C, processing time – 103 min, salt concentration – 20% w/w and solution to sample ratio 15:1w/w. At these optimum values, water loss, solid gain and weight reduction were found to be 35.10 (g/100 g fresh sample), 9.80 (g/100 g fresh sample) and 25.3 (g/100 g fresh sample) respectively.

Keywords: *Optimization, Osmotic dehydration, Pear, RSM*

CPTSO106

ERGONOMICS MUSCULO-SKELETON DISORDER

S. Sathian

Department of Chemical Engineering, Annamalai University

Email: sathee.selvakumar@gmail.com

Abstract

Musculo-skeletal disorders (MSD) are a major cause of disability in the working population. There are two fundamental types of injuries, one is acute and painful, the other chronic and lingering. The first type is caused by a strong and short-term heavy load, leading to a sudden failure in structure and function. The second results from a permanent overload, leading to continuously increasing pain and dysfunction. Chronic injuries resulting from long term loading may be disregarded and ignored by the worker because the injury may seemingly heal quickly and it may not result in an actual significant impairment. In industrialized countries, about one-third of all health-related absence from work are due to musculoskeletal disorders. Back injuries have the highest proportion (approximately 60%). The second position is taken by injuries of the neck and upper extremities. It is generally accepted that working conditions and work load are important factors for the development and continuance of these disorders. A systematic Ergonomics improvement

process removes risk factors that lead to musculoskeletal injuries and allows for improved human performance and productivity.

Keywords: *Musculoskeletal System, Ergonomics, Chronic, Tendinitis, Dysfunction*

CPTSO107

STUDY ON THERMAL CATALYTIC CRACKING OF RAW VEGETABLE OIL INTODIESEL BLEND OIL

Ajithkumar.M¹, Afrid.A², Gowri.M³, Arikrishnan.M⁴

^{1,2,3,4} UG Scholar, Department of Chemical Engineering, Paavai Engineering College,

Email: ajithmozhi555@gmail.com.

Abstract

The thermal catalytic cracking of jatropha curcus, sunflower oil, cotton seed oil and neem oil was evaluated for the production of biofuels as an alternative to fossil fuels. This study includes the test of thermal decomposition for the biofuel production from vegetable oil. Thus an attempt has been made to study the vegetable oil with and without inert material in a batch reactor .The experiments were carried out under at a temperature of 150 to 350 , and atmosphere Pressure After the thermal catalytic cracking of vegetable oil to study about the decarboxylation, polymerization and atomized Of treated vegetable oil .From the results we are comparing the studies of the exhaust gas from diesel engine using diesel and raw, treated vegetable oil blend and also compare the physical Characteristics of the product obtained (density, specific gravity, higher heat value, flash point and kinematic viscosity) were in line with ASTM D6751 (B100) standards.

keywords: *Thermal catalytic cracking, raw vegetable oil, 13 X Zeolite, ASTM.*

CPTSO108

OHSAS 18001 AND ISO 45001 A COMPARISON

B.Gopalakrishnan

Assistant Professor, Department of Chemical Engineering, Annamalai University

Email:gopalakrishnan.chem@gmail.com

Abstract

Establishing an effective occupational health and safety management system at workplaces is crucial for organizations to prevent work accidents and occupational diseases. OHSAS 18001 occupational health and safety management standard, which has been the reference standard for many years all over the world, leaves its place to the newly issued ISO 4500:20181 standards. ISO 45001, which was first published by ISO (International Standards Organization) in the area of occupational health and safety, will be different from OHSAS in that it will be integrated with other management system standards like ISO 9001 Quality Management System and ISO 14001 Environmental Management System. In addition, the new standard includes innovations in many of the topics not mentioned in OHSAS 18001 or mentioned in limited scope. In this study, the innovations introduced by the new Occupational Health and Safety Standard are addressed, the differences between the OHSAS 18001 and ISO 45001 standards are presented, and various suggestions on the process of transition to the new standard are presented.

Keywords: *Management System, Safety Management, ISO 45001, OHSAS 18001.*

FNO102

**ELECTRONIC DISCUSSION GROUPS ON FOOD AND NUTRITION
ISSUES**

V.Suriya¹, D.Shyamala², A.Angelin Rosy³

^{1,2}Student - MCA, PMCTECH-Hosur

³Profesor - MCA, PMCTECH-Hosur

Email:Suriyavenkatasalam97@gmail.com, angelinrosym@gmail.com

Abstract:

The global food problem consists of the lack of food provision for the earth's population. Lack of food and its poor quality cause a negative impact on people health, labour force quality and productivity, i.e.it prevents economic growth. Nutrition's can be grouped into fat, carbohydrate, water, vitamins, protein and minerals. Food and nutrition are closely related to health. Both food and nutrition are matters of Public Health. Actually, one of the main Problem for human Health concerns includes access to minimal, essential, nutritionally adequate and safe food for everyone. 'superior nutrition' is base for a safety life, but the moment malnutrition is a un-safety life. It causes Public Health problem in worldwide. 'meagre nutrition' can refer to under nutrition, defined as the outcome of insufficient food and nutrients intake. The Nutrients problems of developing a country are conditioned by poverty, near exclusive reliance on plant sources of nutrients, and high rates of infections. some common deficiency diseases are protein-energy malnutrition, nutritional enemies, vitamin. A deficiency, iodine deficiency, and possibly others.

Key words: food, Nutrients, fat, Health, safe

GCO102

**POTENTIAL UTILIZATION OF GREEN CHEMISTRY IN PHARMACY
INDUSTRIES**

G.Swathi¹, S.Sriangalaparameshwari², K.Abirami³, S.Kirubhakan⁴

^{1,2,3,4}UG Student, Department of Chemical Engineering, Paavai Engineering College, Pachal, Namakkal.

Email: swathisuji99@gmail.com

Abstract

Chemistry brought about medical revolution till about the middle of 20th century in which drugs and antibiotics were discovered. The green chemistry revolution is providing enormous challenge to those who practise chemistry in industry, education and research. Green chemistry is a philosophy and study of design of product or substances that involve materials harmful to environment. It is a modern science of chemistry that deals with application of environmentally, friendly chemical compounds. The quality of life on earth become much better due to discovery of dyes, plastics, cosmetics and other material. The main among them being the pollution of land, water and atmosphere this is caused mainly due to effect by-products of pharmacy industries which are being discharge into air, river, ocean and the land. The use of toxic reactants and reagents also make the situation worse. As on today, maximum pollution to the environment is caused by numerous chemical industries

KEYWORDS: Hazards waste, Catalyst, Green solvent, Environmental impact.

GCO103

**DYEING OF SILK FABRIC WITH ECO-FRIENDLY NATURAL DYE
OBTAINED FROM OPUNTIA FICUS-INDICA USING SINGLE
MORDANTS**

Kumaresan.M¹

¹Professor and Head, Department of Chemistry, Erode Sengunthar Engineering College, Perundurai,
Erode-638057

Email: mkumsrenu@gmail.com

Abstract

Bleached silk fabric was dyed with natural dyes obtained from the flower of *Opuntia ficus-indica*. The colour fastness properties and colour strength of dyed silk fabric were determined and compared. From the comparative study of fastness properties and colour strength of the dyed silk samples, *Opuntia ficus-indica* in simultaneous mordanting method with 3% mordant combination gives better results.

Keywords: *Opuntia ficus-indica, Silk, Fastness, Mordants, Natural dye*

GCO104

**COMPARISON OF PROPERTIES OF ECO- FRIENDLY NATURAL DYED
COTTON FABRIC**

Kumaresan.M¹

¹Professor and Head, Department of Chemistry, Erode Sengunthar Engineering College, Perundurai
Email: mkumsrenu@gmail.com

Abstract

Fastness properties of the flower of *Opuntia ficus-indica* and *Spathodea campanulata* dyed cotton fabric have been studied using different combination (1:3,1:1 and 3:1) of various mordants, such as myrobolan: nickel sulphate, myrobolan: aluminium sulphate, myrobolan: potassium dichromate, myrobolan: ferrous sulphate and myrobolan: stannous chloride. The wash, rub, light and perspiration fastness of the dyed samples have been evaluated. Comparing the fastness properties and colour strength of flower of *Opuntia ficus-indica* and *Spathodea campanulata* dyed cotton by using combination of mordants. In the comparative study of fastness properties and colour strength of the dyed cotton samples *Opuntia ficus-indica* in simultaneous mordanting method with 1: 3 mordant combination gives better results than using flower of *Spathodea campanulata*.

Keywords: *Spathodea campanulata, Cotton, Dyeing, Mordant, Natural dye, Opuntia ficus-indica*

MMTO101

TRIBOLOGICAL STUDY ON FRICTION STIR PROCESS OF ALUMINIUM METAL MATRIX COMPOSITE

Michael Joshua¹, Mohamed Al Ameen², Renold Augustine³, Santhosh Kumar⁴, Rajesh.M⁵

Department of Mechanical Engineering, Karpagam College of Engineering, Coimbatore.

Email: michaelsojoshua77@gmail.com

Abstract

The composite materials are replacing conventional materials due to high weight to strength ratio, higher stiffness with low density, wear and corrosion resistance. There will not be any change in the chemical, physical and mechanical properties of individual elements i.e. matrix and reinforcement. In recent years the efforts were done to make the aluminium alloy products at low cost and low density. In an effort to minimize the drawback, attempts have been made to fabricate metal matrix composites by using aluminium as matrices. When fabricating aluminium, silicon carbide, boron carbide and oxide are frequently considered as reinforcements, these are used in the form of particles and fibers. This metal matrix composite is made by stir casting method to fabricate After the Stir casting process, the casted metal is to surface finished by vertical machining center to obtain the mechanical properties such as tensile test, hardness test. By adding the composition of 5% of SiC and 5% of B4C with Al7075 alloy the mechanical properties is to be good in tensile and hardness results. Friction stir welding is a solid-state joining process, it is one of the process to joining the MMCs Thus the FSW of Aluminium metal matrix composite will be studied under tribological parameters and to obtain the mechanical properties of the fabricated material. This process is also leads to provide high strength when compared to conventional process.

Keywords: Tribology, Stir Casting, Friction Stir Welding, Mechanical Properties

MMTO103

MIVAN TECHNOLOGY

M.Susithra¹, Thin Naing Aung², M.Ancilin³

Department of Civil Engineering, Kamaraj College of Engineering and Technology

Email: 17uciv038@kamarajengg.edu.in, susithramurugan08@gmail.com

Abstract

Mivan is basically an aluminium form work system developed by one of the construction company from Europe. Mivan is a versatile formwork. It is fast, simple, adaptable and cost-effective. It produces total quality work which requires minimum maintenance and when durability is the prime consideration. In mivan shuttering we can cast whole slab, beam, column at one go making the unit a composite structure. The construction activities are divided as pre – concrete activities, during concreting and post – concrete activities. They are as follows : Pre-concrete activities : a) Receipt of Equipment on Site b) Level Surveys c) Setting Out d) Control / Correction of Deviation e) Erect Formwork f) Erect Deck Formwork g) Setting Kickers . Post-concrete activities: a) Strike Wall Form b) Strike Deck Form c) Clean, Transport and stack formwork d) Strike Kicker Formwork e) Strike wall f) Erect Wall. High speed of construction can be achieved by this system that means faster completion of project. 7 Days per floor. Around 200 repetitions can be achieved while using Aluminium Formwork System.

Keywords: Versatile formwork, 200 repetitions, Minimum maintenance, Pre-concrete activities.

MMTO104

RAPID PROTOTYPING (4D PRINTING)

Raghulvishwakumar.V¹, Syed Mohamed Farhan.S², Santhosh Britto Kennedy³, SaiAnirudh.R⁴

^{1,2,3,4}Kamaraj College of Engineering and Technology, Madurai

Email: raghulvichu@gmail.com

Abstract

Rapid prototyping is a group of techniques used to quickly fabricate a scale model of a physical part or assembly using three-dimensional computer aided design (CAD) data. Construction of the part or assembly is usually done using 3D printing or “additive layer manufacturing” technology. The first methods for rapid prototyping became available in the late 1980s and were used to produce models and prototype parts. Today, they are used for a wide range of applications and are used to manufacture production-quality parts in relatively small numbers if desired without the typical unfavourable short-run economics. This economy has encouraged online service bureaus. Historical surveys of RP technology start with discussions of simulacra production techniques used by 19th- century sculptors. Some modern sculptors use the progeny technology to produce exhibitions. The ability to reproduce designs from a dataset has given rise to issues of rights, as it is now possible to interpolate volumetric data from one-dimensional images.

Keywords: *prototyping, tointerpolate, sculptors, tointerpolate, fabricate*

MMTO107

**A LITERATURE REVIEW ON INCREASING THE PERFORMANCE OF
DIESEL ENGINE BY THERMAL BARRIER COATING**

V. Achuthan¹, M. Chinnapandian²

¹Ph.D scholar, Department of Mechanical Engineering, St. Peter's University, Chennai

²Professor and Head, Department of Aeronautical Engineering, St. Peter's College of Engineering and Technology, Avadi, Chennai

Email: ishatpt@gmail.com

Abstract

The diesel engine in general is referred as compression ignition engine, whose primary role is to ignite the petroleum fossil fuels because of high temperature created by the compression of air fuel mixture. Diesel engines play a great role in the sectors of power, propulsion and transportation. As civilization is growing every day, the transport becomes essential part of human life. In general, the Diesel engines are more efficient when compared with the petrol engines, since the spark ignition consumes more fuel than the compression ignition engine. This paper in detail discusses about the prominent ways in increasing the performance of a diesel engine especially thermal barrier coating.

Keywords: *compression ignition engine, spark ignition engine and thermal barrier coating*

NTO102

**PREPARATION, CHARACTERIZATION AND FORMATION
MECHANISM OF NANO CARBON BALLS**

V.Priya¹, S.K. Krishna²

¹Research Scholar, Department of Chemistry, Chikkaiah Naicker College

²Department of Chemistry, Chikkaiah Naicker College, Erode

Email: priyavelusamy.m.sc@gmail.com

Abstract

The Nano carbon ball was prepared initially by green procedure using carbonization of the stems of Alternanthera Sessilis in muffle furnace under constant flow of Nitrogen. The carbonized stems were converted into Nano particles by using waste engine oil as precursor, LPG fuel mixed with air and combustion chamber. Physico-chemical parameters of Nano carbon balls such as pH, pHZPC, Bulk density g/mL, BET Surface Area, m²/g, Moisture content, %, Volatile matter, % and Scanning Electron Microscopic images were characterized. Used motor oil typically contains long chain hydrocarbons like octane, hexane and substituted hexane and also contains nearly 14% of sludge formed by the oxidative addition of long chain hydrocarbons. The presence of high concentration of polycyclic aromatic hydrocarbons (PAH) will favour the formation of fullerene like carbon balls during the carbon formation. At higher temperature, this precursor oil decomposes and forms a carbon nucleus. This leads to the concentric texture growth of fluid cokes of Nano carbon spheres (NCS).

Keywords: Nano carbon sphere, Volatile matter, Moisture content, Bulk density, Polycyclic aromatic hydrocarbons

NTO103

**EVALUATION OF ANTICORROSIVE BEHAVIOUR OF ZnO
NANOTETRAPODS ON AZ91 GRADE Mg ALLOY**

R. Brindha¹, M. Selvam^{1*} and K. Sakthipandi²

¹Department of Nanoscience and Technology, K. S. Rangasamy College of Technology, KSR Kalvi Nagar, Tiruchengode, Tamil Nadu, India.

²Department of Physics, Sethu Institute of Technology, Kariapatti 626 115, Tamil Nadu, India.

Email: brinzmalathi@gmail.com, selvamic@gmail.com, sakthipandi@gmail.com

Abstract

Highly cross-linked zinc oxide nanorods with the structure of tetra-pods were successfully prepared by using microwave irradiation technique. While comparing with the available conventional techniques, microwave irradiation technique has the advantages of producing different morphological structures with high purity and shorter reaction time. These tetra-pods consist of a zinc oxide core in the zinc blende from which four zinc oxide arms is formed in the wurtzite structure. The effect of time affecting dimension of zinc oxide nanotetra-pods were noted in this investigation. The growth mechanism during the formation of zinc oxide nanorods was highlighted. The morphological, structural and optical property of zinc oxide nanorods were investigated by field emission scanning electron microscopy, X-ray diffraction, ultra violet visible spectrometer, energy dispersive spectroscopy. The electrochemical corrosion behavior of Mg alloy (AZ91) and ZnO nanotetra-pods coated Mg alloy were investigated. The tafel plot reveals that the corrosion of Mg drastically drops when coated with thin layer of zinc oxide nanotetra-pods (Mg/ZnO) compared to Mg in KOH electrolyte.

Keywords: Microwave irradiation; ZnO nanotetra-pods; Structural properties; Optical properties

OASO102

**INTELLIGENT REFRIGERATION AND FOOD MANAGEMENT
SYSTEM USING MACHINE
LEARNING**

Medhavi Singh¹ Aman Malhotra²

^{1,2}SRM IST, Chennai

Email: singh.medhavi23@gmail.com, amanmalhotraa5@gmail.com

Abstract

The paper focuses on the application of standardized notation and labelling of food items to store them in a refrigerator. The standardized database can be accessed by the user that would thus help the refrigerator to understand the lifespan and condition of the food item. The refrigerator thus allows us to have control over the shelf life of the food item and also to determine the expiry time of the same. The data and the information of the food product are obtained with the help of camera and texture is analyzed to understand the condition of the food items then analyzed by the system to generate visual patterns and light outputs on the storage compartment accordingly. The compartments are fitted with sensors to detect the presence of the object and show the output. The food spectrum generated can help us to analyze the food shelf life and also to determine how long food can stay fresh. The data acquired is stored in a logger and is also sent to a web server. The data acquisition and storage system can be used for the understanding of food life and impact of refrigeration on it.

Keywords: *Machine learning, Food expectancy, Image Processing, Bio Spectroscopy*

OASO103

**COMPREHENSIVE STUDY ON FACE DETECTION AND
RECOGNITION TECHNIQUES**

B. V. M. Sai Dileep¹, S. Bhuvaneswari², R. Saranya^{3*}

^{1,2}Student, Department of Computer Science, Central University of Tamil Nadu, Thiruvavur

³Assistant Professor, Department of Computer Science, Central University of Tamil Nadu, Thiruvavur

Email: saidileep97@gmail.com, bhuvisiva24@gmail.com, saranya@cutn.ac.in

Abstract

In recent trend, Face detection and recognition has become extensively used security-based access control mechanism. It has acquired great deal of research in image processing and computer vision based facial endorsement domains. Face detection is the process of capturing and perceiving the digital image of an individual through a well framed camera and it can be progressed towards automatic face recognition that performs an unequivocal analysis with patterns of the face against trained facial attributes available in the database to obtain an accurate match of facial characteristics. In addition to rendering a unique identity of an individual, these technologies can be used as an alternative for biometric based authentication systems and forensics. In this paper we have presented a comprehensive survey of different methodologies and applications of this field. The discussion predominantly focusses on prevalent techniques like (i) Principal Component Analysis (PCA) using Eigen Faces. (ii) Linear discriminant Analysis (LDA) which is a supervised learning technique for pattern recognition in the facial features. (iii) Machine learning approaches like Viola - Jones Haar cascade classifiers with the trained number of positives and negative images, analogous elements are extracted using Raspberry pi.

Keywords: *Eigenvector; Haar classifier; Eigenfaces; Raspberry pi; Putty client*

OASO104

**IMPLEMENTATION OF MEDIUM FREQUENCY HIGH POWER
SUPPLY FOR TRACTION APPLICATION**

Aiswarya Krishnan¹, V.Gopu²,

¹PG Scholar, Electrical and Electronics Engineering, Sri Ramakrishna Engineering College

²Assistant Professor Electrical and Electronics Engineering, Sri Ramakrishna Engineering College

Email: aiswarya.1761001@srec.ac.in, gopu.venugopal@srec.ac.in

Abstract

The evolution of power electronics is ushering to an improved industrial revolution. Power electronics is the state of art for traction systems. Incorporating modern high-power semiconductors in the traction systems opens up the opportunity to replace low frequency transformers with a new medium frequency power supply structure. A double stage power architecture is proposed, which converts DC/DC/AC voltages. A boost converter is designed with 20kHz switching frequency converting 100V DC to 600V DC. The Pulse Width Modulation (PWM) is utilized in single phase inverter to achieve high conversion efficiency. Conventionally used MOSFET switches are replaced by Insulated Gate Bipolar Transistors (IGBT) as it is more preferred for medium voltage applications with a breakdown voltage of 500V to 650V. Medium frequency power conversion can effectively reduce the volume of passive components and lead to higher power density design for high voltage power supply. The system design is simulated using MATLAB Simulink.

Keywords: *Medium frequency, Traction system, PWM, IGBT*

OASO109

**ARTIFICIAL INTELLIGENT BASED IOT SYSTEM FOR
PRESERVATION OF MILK USING WIRELESS SENSOR NETWORKS**

V.Keerthanah¹, S.Kiruthika², Dr.S.Karunakaran³

^{1,2}Student, School of Computer Technology & Applications, Kongu Engineering College

³Faculty, School of Computer Technology & Applications, Kongu Engineering College

Email: keerthanah.vh@gmail.com

Abstract

In developing countries like India, the conservation of milk is of major concern due to the lack of supply at many households in rural and Industrial areas. The milk which possess high adulteration, bacterial content, less quantity of saturated fat, freshness gets spoiled easily and hence immediate refrigeration of milk will prevent it from spoiling. In existing system a collection vehicle is assigned for each group of areas. If the vehicle fails to arrive at a particular destination at correct time the milk gets spoiled and becomes useless. Our method eliminates this drawback by sensing the quality of milk using pH meter and directs the vehicle to the appropriate places so that collection of milk may be fastened up which leads to its ultimate conservation. The good milk should have the pH value 6.7. The milk which has greater or lower value is considered to as less quality milk. We propose an effective system utilizing wireless sensor networks with induced artificial intelligence. This system consists of a sensor unit along with a master node which monitors the quality of milk. The sensor unit observes the quality of milk using the pH meter and reports it to the master node. At each collection point the sensor will be used to determine the quality and is reported to the master node. The application module with induced artificial intelligence analyses the current input data received from various sites and detects the collection point where the milk will get degrade quickly.

Then it redirects the vehicle to appropriate places by sending the instructions through automated Short message service (SMS) and fastens up the process. If an alert is generated from a large number of sites instructing that the milk is prone to deterioration, then an effective routing algorithm (Open Shortest path Algorithm) can be implemented so that the vehicle reaches the collecting point and the milk is conserved to the maximum possible extent.

Keywords: *Wireless sensor network, SMS, pH meter, Artificial Intelligence, Routing Algorithm*

OASO115

A VISION IN THE DARK FOR THE VISUALLY CHALLENGED - EDUCATION THROUGH CLOUD COMPUTING

Elakkya.C¹, Dharani.S², Karunakaran.K³

^{1,2,3}Kongu Engineering College

Email: elakkiya.chellamuthu@gmail.com

Abstract

The Internet is an interconnected collection of Autonomous systems. Cloud computing is an emerging computing technology that uses the internet and central remote servers to maintain data and applications. It is a dynamic computing power with limits and billed depending on utilization of resources. Advances in technology offer new opportunities in enhancing teaching and learning. Many advances in learning technologies are taking place throughout the world. P.Y. Thomas, who wrote a paper on cloud computing and education, suggested that teachers can start online portfolios where teachers can put summaries of their major teaching accomplishments. Students can write reviews and feedback on what they think and what they learned.

Keywords: *virtual reality systems, hepatic technology, forbid education, network server, e-learning*

OASO116

DETECTION OF NOISE FOR DISCRIMINATION OF FALSE ARRHYTHMIA ALARM IN ICU USING ECG SIGNALS

R.M.Vysali¹, M.Praveena², D.Sakthisneka³, Dr.S.Mary Praveena⁴

^{1,2,3}UG Student, ECE, Sri Ramakrishna Institute Technology, Coimbatore, India.

⁴Associate Professor ECE, Sri Ramakrishna Institute Technology, Coimbatore, India.

Email: vysali1998@gmail.com

Abstract

The False Arrhythmia alarm is the insignificant alarm caused by the monitoring systems. The large number of false alarms in intensive care is a severe issue. The alarms caused by noise peaks can be high and in a noisy environment nurses can experience stress and fatigue. In addition, patient safety is compromised because reaction time of the caregivers to true alarms is reduced. This paper involves various approaches and it can be roughly divided into filtering methods, signal quality assessment, multi-parametric analysis, machine learning approaches, or combinations of the previous methods. The purpose of this paper is to develop algorithms to lower the incidence of false arrhythmia alarms in the ICU using information from independent source electrocardiogram (ECG). This approach relies on robust adaptive signal processing techniques in order to extract accurate heart rate (HR) values from the different waveforms. This paper proposes an algorithm that sets off alarm in high decibel sounds and is capable of distinguishing true and

false arrhythmia alarm events accurately. The Electrocardiogram signals is pre-processed to remove the common noise like baseline wander, trends and the pacemaker spiking. The feature extraction process is by different types of entropies such as Shannon entropy and Log energy entropy. The R wave peaks of the ECG signal are detected by using the Pan Tompkins algorithm. This significant method is used to reduce the occurrence of false alarms in emergency unit using the ECG Signals.

Keywords: *Noise removal, Filtering methods, False arrhythmia alarm, ECG Signals, Feature extraction, Pan Tompkins algorithm*

OASO123

ADVANCED LOAD SHARING FOR EFFECTIVE ENERGY USING VIRTUAL MACHINES SCHEDULING IN CLOUD ANALYSIS SOFTWARE DEFINED NETWORK

Dr.M.Ramesh Kumar¹, Manjubashini.B²

^{1,2}Department of Computer Science and Engineering, Dhirajlal Gandhi College of Technology

Email: manjubabu16kavitha@gmail.com

Abstract

In this Paper, knowledge centres intelligent considering the position of virtual machines on the servers in the data centre. The problem has been developed as Associate in Nursing whole number programming problem, prove that its NP-hard, and so explore two greedy algorithms, minimum energy virtual machine (VM) programming algorithmic rule (MINES) and stripped-down communication virtual machine programming rule (MINCS) within the performance of the tenant's service-level agreements. Our projected mechanism doesn't need researching and redirection routing for the lost Bigdata server through link loss info during a content map update and also the location of the queried knowledge to be sent to the content of the map. Peers communicate with different peers mistreatment messages transmitted over the network. If two peers are able to send and receive the message directly. Otherwise, negotiate peer needed to transmitted messages, and there is an indirect connection between these two peers. In this case, the agents act as routers. We prove the convergence of the Markov Decision Process (MDP) based dynamic VM management and analyze the boundary of its approximation error. The rule maintains and updates a virtual (shadow) queuing system, and therefore the routing supported the state of the system.

Keywords: *Greedy Algorithms, Energy Virtual Machine Scheduling Algorithm, Big data Service Providers, Markov Decision Process, Virtual (shadow) Queuing System*

OASO126

**INVESTIGATION OF USER SATISFACTION IN RESIDENTIAL
BUILDING WITH DEMAND SIDE LOAD MANAGEMENT USING
FUZZY SYSTEM**

R.Kaviya¹, PL.Somasundaram²

¹PG Student, Department of Electrical and Electronics Engineering,

²Senior Associate Professor, Department of Electrical and Electronics Engineering, M.Kumarasamy
College of Engineering (Autonomous), karur

Email: kaviya170695@gmail.com, somasundarampl.eee@mkce.ac.in

Abstract

In current years energy demand in the consumer side (load side) is increasing day by day. In the past decade of years more different technologies are used to encounter the power demand with a high quality of power and reliable system. Recently, energy consumption is reduced by giving priority to a load of residential buildings. In this paper presents the demand side load management by controlling the loads within the residential limits by using the fuzzy system. The system considers the rating of an electrical device, time of power usage, satisfaction to the consumer and cost of energy utilization. The priority level of load has an output as minimization of user cost and maximize user comfort (satisfaction) level. The predefined budget applied the fuzzy inference system to reduce use cost, by creating fuzzy membership function and fuzzy rules. The result reveals that the proposed system suggest the crisp value of reduction of user power consumption cost and maximization of user satisfaction.

Keywords: Demand Side Load Management, Fuzzy Inference System, Membership Function, Fuzzy rules, Maximum user satisfaction at minimum cost.

PCO103

**STUDIES ON EFFECT OF NATURE OF SHORT FIBERS / CARBON BLACK
ON CURING CHARACTERISTICS AND PHYSICO-MECHANICAL
PROPERTIES OF ETHYLENE PROPYLENE DIENE MONOMER RUBBER
COMPOSITE**

G.Mohankumar¹ and A. Murugesan^{2*}

^{1,2}Department of Chemical Engineering, Nandha Engineering College (Autonomous), Erode

Email: petromohankumar@gmail.com, jmtechnologist@yahoo.co.in

Abstract

In this research work, ethylene propylene diene rubber (EPDM) composites were prepared by incorporation the various types of short fibers like cellulose, polyester, p-aramid, m-aramid, cotton short fibers and carbon black on a 2-roll mill. The effect of different short fibers content on the curing characteristics and physico-mechanical properties of EPDM composites were studied. When the loading of carbon black was fixed, it was found that carbon black content had no effect on scorch time. The cure time, minimum torque and maximum torque noted with the nature of short fibers used. Using the p- aramid short fiber content tended to increase the hardness of the Ethylene Propylene Diene Rubber Composites. However, the tensile strength and elongation at break varied by varying the types of short fibers. Ethylene Propylene Diene Rubber Composites showed the better abrasion resistance and compression set while the fibres load was fixed as 30 phr. The volume swell in ASTM I and III oils, heat ageing resistance of different short fibres filled

Ethylene Propylene Diene Rubber composites were also studied. Moreover, the modulus σ_{20} , σ_{50} and σ_{100} for different short fibers filled in EPDM rubber composites studied and their results were critically compared. It was found that Polyester short fiber with 30 phr loading improved the curing characteristics and physico-mechanical properties of the EPDM composites due to 4.6- 5.4% ENB content.

Keywords: *Ethylene propylene diene rubber, Short fibers, Reinforcement, Polymer Composites*

PCO105

BIOPLASTIC FROM CRAB SHELL WASTE VIA AN ULTRASONIC METHOD- AN ECO-FRIENDLY APPROACH

P. Kannan¹, Lakshna devi², Gopalakrishnan Sarojini^{3*}

¹Department of Chemistry, Bannari Amman Institute of Technology, Erode

^{2,3*}Department of Petrochemical Engineering, SVS College of Engineering, Coimbatore -642109

Email: srima06 @gmail.com, grsarojini@gmail.com

Abstract

Conventional plastic is made from petroleum, a fossil fuel and contributes to climate change. Bioplastics are made from plant and animal material and are alternative to conventional plastic. Valorisation of crab shell waste can provide opportunities to produce new valuable bioplastics. In this study, crab shell waste is converted into bioplastics. An ultrasonic process is used to convert crab shell wastes into bioplastics is reported. The process is easily scalable and there are no environmental concerns associated with the usage of hazardous chemicals. The converted bioplastics are completely biodegradable and environmentally friendly. The plastics created are durable. The characteristics were confirmed by the results of FTIR.

Keywords: *Bioplastic, crab shell, FTIR, physical parameters, ultrasonic*

PCO106

STUDIES ON ASYMMETRIC MEMBRANE FOR TREATING MUNICIPAL WASTE WATER

Sakthivel.E¹, Shanmugasundaram.S², Siddharth.T.S³, Sathish Raam.R^{4*}, Chitra Devi.V⁵, Mothil.S⁶

^{1,2,3}Department of Chemical Engineering, Kongu Engineering College, Perundurai

^{4*,6}Assistant Professor, Department of Chemical Engineering, Kongu Engineering College, Perundurai

⁵Professor, Department of Chemical Engineering, Kongu Engineering College, Perundurai

Email: sakthivino042@gmail.com, sathishraam.chem@kongu.edu

Abstract

Membrane technology has become a dignified separation process over the past four decades. The main force of membrane technology is the fact that it works without addition of chemicals, with a relatively low energy use with easy and well-arranged process conditions. The principle is quite simple that the membrane acts as a very specific filter that will let the influent to flow through, while it catches suspended solids and other substances (cakes). Cellulose acetate and poly vinyl alcohol membrane was fabricated using immersion precipitation technique. Cellulose acetate is first dissolved in dimethyl sulphoxide and heated for two hours followed by the dissolution of poly vinyl alcohol for next two hours. The solution is then allowed to cool at room temperature and is cast on a glass plate. Then SiO₂ is impregnated in the prepared membrane. Municipal waste water is collected and sent for preliminary analysis. Glycerol was chosen as the cross linking agent. The fabricated membrane is placed in a membrane reactor for treating waste water.

Nitrogen gas was used to effect the separation. The membrane before and after usage is characterized. (Permeation flux, SEM analysis, Contact angle, Pore diameter, Pore size). Parameters like Turbidity, COD, BOD and pH were investigated for the treated water samples. This process has significant importance in waste water treatment, desalination and water Purification process.

Keywords: Membrane fabrication, Cellulose acetate, Poly vinyl alcohol, waste water treatment

PICAO102

REAL-TIME MONITORING SYSTEM OF INDUSTRIAL MACHINES WITH NODEMCU USING IOT

Aravindh.V¹, Abdul Muqsit.M², Mohamed Ibrahim.A³

^{1,2,3}UG Student, Electrical & Electronics Engineering, KPR Institute of Engineering & Technology, Coimbatore

Email: aravindh.kgl@gmail.com, adbulmuqsit019@gmail.com, mohamedgct06@gmail.com

Abstract

Internet of Things (IoT) is an imaginative way to deal with interface different gadgets through the web and utilize such an interconnection to actualize profoundly valuable capacities. In this paper, an IoT-based framework has been proposed for the ongoing checking on industrial machines through remote sensor networks. In the mechanical divisions the machines run consistently all through the year, so there is higher possibility for execution of the machines to get reduced. In request to screen the execution of the machines at each moment of time and remotely through remote sensor systems with node cu controller and thing speak cloud. Node MCU's fundamental capacities are to process information from sensors with the machines, tell client about framework disappointment, and send data to the server. The acquired outcomes are assessed utilizing thing speak open information IoT stage with information investigation. A noteworthy preferred standpoint of the proposed framework is its cost viability. This model would examine the information and report it to the clients.

Keywords: Node MCU, Thingspeak, Internet of things

PICAO103

A COMPARATIVE ANALYSIS OF CONVENTIONAL PI CONTROLLER WITH FUZZY CONTROLLER FOR A NON-INTERACTING SYSTEM.

Jayanth Sarangan¹, Vitapu Gnana Sagar², Janani.R^{3*}

^{1,2}Student, ³Assistant Professor, Department of Electrical and Instrumentation Engineering, Sri Chandrasekharendra Saraswathi Viswa Maha Vidyalaya, Kanchipuram

Email: jayanths_98@gmail.com, vitapugnanasagar@gmail.com, janani.rajaraman@kanchiuniv.ac.in

Abstract

In present paper, an SISO model of non-interacting liquid level system has been taken for the analysis and the different controller designing methods are applied to the mathematical model and performance characteristics is compared with the fuzzy based PI controller. Initially transfer function for the model is derived, and various control (Conventional Controllers) algorithm are used to design PI controller. The error and change in error is used as fuzzy variables and membership functions are defined in order to obtain the suitable PI controller. The effectiveness is demonstrated both in simulation and real time environment

using Simulink software. Also, the closed loop performance indices are tabulated and compared with other conventional controller.

Keywords: *Non-Interacting system, SISO Process, Fuzzy Controller, ZN Controller*

PMSO101

DYNAMIC SIMULATION OF HEAT TRANSFER THROUGH COOLING TOWER

Rajasekar. S¹, Aparna.D², Minakshi.A³, Meyyappan.N⁴

^{1,2,3}UG Student, Department of Chemical Engineering, Sri Venkateswara College of Engineering
Tamil Nadu, India

⁴Professor, Department of Chemical Engineering, Sri Venkateswara College of Engineering
Tamil Nadu, India

Email: nmena@svce.ac.in

Abstract

This paper deals with the control dynamics of transient simulation of heat transfer through cooling tower using simulation tool. Cooling tower is one of the important systems with wide diversity of applications in oil refineries, petrochemical and other chemical plants. The transfer function is taken as first order system plus dead time (FOPDT). The effect of step change in the fluid inlet temperature is analysed also observed the steady state and transient simulation of heat transfer through cooling tower using simulation tool. The simulation results for inlet step change in cooling tower have been discussed.

Keywords: *FOPDT, step change, steady state.*

PRPO101

DEVULCANISATION OF TIRE: SEPARATION OF BUTADIENE BY THERMAL DEPOLYMERISATION

R.Srimathy¹, K.Anbarasi²

^{1,2}Department of Petrochemical Technology, University College of Engineering, AU BIT Campus.

Email: anbarasikarunanithi@gmail.com

Abstract

The vulcanised tire waste is ecologically problematic because they are non-biodegradable, consume large land source and contains about 20-30% of sulfur. About 290 million tires are wasted each year, the vulcanised waste recycling is the potential process of reusing up to 80% of the waste. Our work is the separation of butadiene from vulcanised tire carried out by the sequence of unit operations such as pulverization, devulcanization, solvent recovery, thermal depolymerisation, dehydrogenation and distillation. Devulcanization is generally carried out by four main techniques such as chemical, ultrasonic, microwave, biological, where chemical process is more efficient in solvent recovery process. The greenhouse emission of reclaimed rubbers and tires is 0.1 kg of CO₂/kg and the total energy required for the production is 2.1mj/kg. About 25% of reclaimed rubber products is blended with virgin materials to yield high quality product at commercial cost. Monomers obtained from the thermal depolymerisation and butadiene obtained from distillation under increased pressure are the key component in manufacturing polymers and finds major applications in fields like resins, paints, textiles.

Keywords: *vulcanized tire wastes, non-biodegradable, devulcanization techniques, Reclaimed rubber product and monomers.*

REO103

**EXTRACTION OF OIL FROM MILLETTIA PINNATA SEEDS AND
BIODIESEL PRODUCTION VIA CATALYTIC TRANS-
ESTERIFICATION PROCESS**

Vinothini Venkatachalam¹, Jeeva Senrayan^{2*}

¹Department of Petrochemical Engineering, SVS College of Engineering, Coimbatore - 642 109.

²Department of Chemical Engineering, A C Tech Campus, Anna University, Chennai- 600 025.

Email: jeevaasenrayan@gmail.com

Abstract

The past few decades had seen a rapid hike in the world's population, which has caused an excessive use of fossils and, consequently, the diminution of fossil resources and thus the advent of global pollution problems. Biodiesel production from vegetable oil has gained attention as an alternative fuel to minimize the usage of fossil fuels and reduce greenhouse gases pollution. In this study, the vegetable oil was extracted from *Millettia pinnata* seeds using n-hexane solvent. The lipid composition was analysed using GC-Flame Ionization Detector and the results revealed that oleic acid, is present as a dominant fatty acid composition. The extracted oil was subjected to transesterification process with various methanol to oil ratio and KOH was used as catalyst. The properties of biodiesel such as density, acid value, iodine value and cetane number were analyzed and were compared with those of the diesel and the values are within the acceptable limits of ASTM. The study shows that papaya seed oil has the potential to be used as an alternative feedstock for biodiesel production.

Keywords: *Millettia pinnata seeds, Gas chromatography, Oleic acid, Transesterification, Biofuel*

REO104

**PRODUCTION OF DMF (A TRANSPORT FUEL) BY ISOTHERMAL
BATCH REACTOR FROM EXTRACTED POLYSACCHARIDES**

P.P.Selvi¹, G.Bharathan²

¹Assistant Professor, Department of Chemical Engineering, Kongu Engineering College, Erode

²UG Student, Department of Chemical Engineering, Kongu Engineering College, Erode

Email: selvi@kongu.ac.in, bharathan1389@gmail.com

Abstract

Due to recent CO₂ emissions, there occurs global warming. Hence one of our main platform chemicals obtained from dehydration of C6 sugars is 5-hydroxymethylfurfural (HMF). This above-mentioned C6 sugars is prepared by ourselves from palm wastes by Acid hydrolysis. The use of formic acid- triethylamine mixture (FA/TEA) as hydrogen donor for the hydrogenation 5-hydroxymethylfurfural (HMF) was investigated over a Ru/C catalyst. These HMF with (FA/TEA) is filled in an isothermal batch reactor with agitator, which is coupled with motor for its motion. The reactor should be heated externally by some hot fluids. The reactor with external vent for hot fluid should be covered by means of insulation wall. It has to be within reactor for certain time periods at high temperature. The reactor temperature has to be standardly maintained at above 300 °C. A significant effect of formic acid-triethylamine molar ratio was observed on

the product distribution, where 5:2 molar ratio of FA/TEA. Finally, we can recover a transport fuel named DMF (2,5 Dimethyl furan). Optimization of the reaction parameters showed that temperature, time, FA/TEA molar ratio, Ru/C dosage, HMF concentration as well as agitation speed played important roles in the selectivity to the targeted DMF. It is interesting to note that a very high HMF conversion achieved particularly as temperature increased. However, the intrinsic properties of the Ru/C catalyst determine the reaction pathway towards DMF or other products. After product recovery, product analysis has to be done & calculations have to be performed to find product conversion (X_A).

Keywords: *Furan, HMF, DMF, Batch operations, Dehydration, Acid hydrolysis*

RCE0106

PERFORMANCE AND EMISSION ANALYSIS OF MODIFIED PENT ROOF COMBUSTION CHAMBER (60) IN DIESEL ENGINE

R.Nirmal Kumar¹, K.Matheer Rahman², P.Mohamed Shadab Ather³, T.L.Mohamed Sufiyan⁴,
S.Mohammed Shuaib⁵

¹Assistant Professor of Mechanical Engineering, ^{2,3,4,5}Final Year Mechanical Engineering,
C. Abdul Hakeem College of Engineering & Technology, Melvisharam, Vellore.

Email: mohamedsufiyantlms@gmail.com

Abstract:

Vehicle emission is an important public health problem in most cities of the developing world. Exposure to air pollution can lead to respiratory and cardiovascular diseases. Bharat Stage Emission Standard (BSES) are emission standard instituted by the government of India to regulate the output of air pollution from Internal Combustion Engine equipment, including motor vehicles. The modification of profile of the various parts of the IC engine results in reduction of harmful emission. In this project, the modification is done on the piston head i. e, 60 of the piston quantity is removed by machining in VMM is compared with the conventional piston. Performance & Emission Analysis is done with the help of Diesel Engine. By modifying, we got the result of very less amount of NO_x Emissions & Moderate amount of HC and CO emissions.

Keywords: *Exposure, conventional, NO_x Emissions, Combustion*

REO109

BIO-ETHANOL PRODUCTION

Sarumathi P¹

¹Nandha Engineering College (Autonomous), Erode

Email: sarumathidp@gmail.com

Abstract

Bio-technology has been a substantial improvement to meet the environmental challenges created by the non-biodegradable materials(wastages), pollution, greenhouse emissions, etc., A next generation automotive fuel, bio-ethanol (a bio-fuel) gradually replaces non-renewable fuels (Petroleum-derived fuels). Bio-ethanol is produced from fractional conversions of agricultural raw-materials, cellulose, LCB (Lignocellulosic biomass)/LCW (Lignocellulosic wastes). Thermochemical bio-ethanol could be produced from Gasification of Syngas. Pre-treatment, hydrolysis, depolymerization of cellulose and hemi-cellulose including membrane technologies are developed. 85% ethanol is globally produced by US and Brazil since

2007. Since, bio-ethanol is relatively 68% less efficient than petroleum fuels, it is blended with gasoline. Energy content of petrol and bio-ethanol is 31.5MJ/L and 21.1MJ/L, respectively. Research is being done to use bio-ethanol as a commercial product at pure state to perish the usage of non-renewable resources. Technologies remain unproven and still under continual development due to environmental barriers. Advanced Tech is raising to minimize process energy required for the production.

Keywords: Bio-ethanol, LCB/LCW, Depolymerization, Fermentation, Global production.

WWTO104

**PURIFICATION OF INDUSTRIAL WASTE WATER BY USING
CHARCOAL**

D. Monisha¹, B. Kamal Raj², A.Elamathi³

^{1,2,3}UG Student, Department of Chemical Engineering, Paavai Engineering College, Namakkal

Email: kamal801275@gmail.com

Abstract

In most of chemical industries occurs major problem is pollution of water. The textile waste water includes dyes, detergent, grease, oil, etc. The textile dye waste water has a strong colour, high pH, low biodegradability dyes play on important role as colouring agents in the textile, food industry. Charcoal is a good absorption matter. Hence using the charcoal to remove the dye in the industrial waste water. Charcoal is a light weight black residue consisting of carbon and any remaining ash obtained by removing water and other volatile constituents from vegetation substance. charcoal used to convert dirty water to normalizing water. Absorbent is one of the process in chemical method and used to dye removal in dissert water. From this experimental setup certain process involved such centrifugation, sieve analysis. Adsorption isotherm were performed in a different concentration in dye. And finally, graph will be plotted for to identify the efficiency of dye removal. Graph plotted against time vs efficiency.

Keywords: Activated carbon, absorbents, concentration factor, centrifugation, sieve analysis.

WWTO105

**BIO DEGRADATION OF TEXTILE WASTEWATER BY USING OZONE
GENERATOR**

Purushothaman.V¹, Vinoth.G², Sasi Kumar.V³, Kirubhakaran.S^{4*}

^{1,2,3}UG Student, Department of Chemical Engineering, Paavai Engineering College

⁴Assistant Professor, Department of Chemical Engineering, Paavai Engineering College

Email: purushothaman11999@gmail.com, vinothg1999@gmail.com, sasiragavan1399@gmail.com

Abstract

Water pollution is due to the release of industrial wastewater. It becomes a serious problem in chemical industries. The performance of wastewater treatment plant measures 16 water quality parameters were analysed by collecting influent and effluent wastewater sample of the treatment plant and it is compared with the average values. The ability of the wastewater treatment plant to effectively deals with key pollutants. It shows that the treatment plant is efficient in order to improve on the final effluent quality, sand filters may be introduced after the ozone generator before final discharge into environment aspects.

Keywords: BOD, COD, Ozone Generator

WWTO107

RECYCLING OF WASH WATER FROM RMC PLANTS

G.Anantha Sai Sreelekha¹, Rachel Savio Rozar², Dr.S.Govindarajane^{3*}

^{1,2}UG Student, Department of Civil Engineering, Pondicherry Engineering College

³Professor in Civil Engineering, Department of Civil Engineering, Pondicherry Engineering College

Email: gss11shree@gmail.com, rachelrozar@gmail.com, sg@pec.edu

Abstract

Disposal of waste water from Ready Mixed Concrete (RMC) operations is an important concern of the ready-mixed concrete producers. Most of the traditional disposal systems are no longer environmentally acceptable. It is a common practice in the ready-mixed concrete industry to wash out transit mixer drum at the end of each batch delivery to prevent fresh concrete residue from settling in the drum using approximately 1000 litres of water. Additionally water arises from washing down the yard and batching plant. The current practices for the disposal of wash water include dumping at the job site or dumping at a landfill. Due to this, the groundwater at the dumping site gets polluted. Hence it is necessary to address the problem of handling wastes produced in the RMC operations. Major issues discussed include, source, quality and quantity of waste water; waste water control systems and chemical stabilizing agents. Alternative solution is to recycle the wastewater and use it as batch water to make fresh concrete. The waste consists mainly of water and a variable proportion of coarse and fine aggregates, cementitious powders and chemical admixture.

Keywords: Wash Water, transit mixer, Disposal at landfill, pollution of ground water, recycling waste water

WWTO108

OPTIMIZATION STUDIES ON SORPTION OF COPPER BY A RED ALGAE HYPNEA VALENTIAE

S.Raja^{1*}, B.Gopalakrishnan², M.Rajasimman³

^{1,2,3}Department of Chemical Engineering, Annamalai University

Email: rsrajaa@rediffmail.com

Abstract

Toxic heavy metals are detrimental to human health and ecosystem stability. The removal and recovery of heavy metals from wastewater is important in the protection of the human health and environment. Copper is one of the most widely used metals in electroplating industry. This work reports the utilization of a red algae *Hypneavalentiaeas* as a sorbent material for the removal of copper ions from aqueous solutions. The sorption potential of *Hypneavalentiaeas* investigated in batch experiments. The process parameters are optimized using response surface methodology (RSM). Based on the central composite design, quadratic model was developed to correlate the variables considered in this study to the response i.e. percentage removal of copper. The most influential factor on each experimental design response was identified from the analysis of variance (ANOVA). The optimum conditions are pH – 5.0, temperature – 53.6 o C, sorbent dosage – 6.1 mg/L, metal concentration – 133 mg/L and contact time – 30 min. At these optimized conditions the maximum removal was found to be 85%. A coefficient of determination R² value of 0.97 shows the fitness of RSM for the removal of copper using the algae considered in this work.

Keywords: Optimization, Metal, Copper, Adsorption, Sorbent dosage, Algae

WWTO110

WASTE WATER TREATMENT REUSE & RECYCLE

N.Sudha¹, C.Gokulraj²

^{1,2}UG Student, Department of Chemical Engineering, Erode Sengunthar Engineering College, Perundurai Taluk, Thudupathi Post, Erode -638 057.

Email: sudhakaruna27@gmail.com

Abstract

Wastewater contains organic matter and the three main nutrients for plant production -nitrogen, phosphorus and potassium. The nutrients in domestic wastewater and organic household waste are nearly sufficient to produce enough food for the world population. Nitrogen fertilizer is energy consuming to produce and phosphorus is a limited mineral resource. Recycling the energy aspects are the important factors of sustainable system design. The reuse of the wastewater decreases the money spent on fertilizers which is used as microorganisms. The sustainable waste water treatment system depends upon the area's climate, topography, and socioeconomic factors which will improve the health, economic, and agricultural conditions of a developing community. This paper discuss about the several options to achieve wastewater treatment in urban areas and various approach for the management of valuable wastewater resources.

Keywords: Wastewater, Wastewater treatment technologies, Sustainability, Decentralizing, Reuse, Socioeconomic factors

WWTO111

BATCH ADSORPTION & KINETICS OF NI (II) REMOVAL FROM AQUEOUS SOLUTIONS BY COTTON SEED CAKE

S.Malathi^{1*} and L.Ayarin²

^{1*,2}Department of Chemistry, Erode Sengunthar Engineering college, Perundurai-638057, Tamil Nadu, India.

E- mail: sabari.malathi@gmail.com

Abstract

Activated carbon was prepared from cottonseed cake (CSCC) by chemical activation with sulphuric acid followed by bicarbonate addition, was applied for the adsorption of Ni (II) from aqueous solutions. Batch experiments were carried out to study the effect of various parameters such as contact time, pH and adsorbent dosage on Ni (II) along with, commercial activated carbon (CAC). Surface morphology and elemental analysis of CSCC and CAC before and after adsorption were characterized by SEM and EDX. Compared with CAC, the CSCC had a wider applicable range of pH from 4.0-8.0. Equilibrium data agreed well with Langmuir isotherm for CSCC and CAC respectively. Based on the Langmuir isotherm the adsorption capacity was found to be 53.48 mg g⁻¹ for CSCC which was significantly 3.3 times greater than that of CAC (13.45 mg*g⁻¹). The kinetic data followed pseudo-second order model and thermodynamic parameter shows that the process is spontaneous in nature.

Key words: Adsorption, Cottonseed cake carbon, Kinetics, Langmuir, Freundlich Isotherm

POSTER PRESENTATIONS

OASO114

RECENT VIEW REGARDING CLOUD COMPUTING

Varshini.M¹, Thayial Nayaki.R²

¹Department of Electronics and Communication Engineering, Adhiyamaan College of Engineering, Hosur.
Email: sm.varshu@gmail.com

Abstract

Cloud Computing is one of the most emerging trends in the IT industries and business to safeguard the stored data. It makes use of the smart grid computing and virtualization technique by replacing the maintenance and infrastructure costs of the computer. In cloud computing, a program code or a file can run in parallel without affecting the applications in the system on which it runs. Though this technology have more flexibility, but it faces data loss and data thefts. The user's personal data can be lost permanently by vulnerability attacks and data breaches. Cloud Computing provides multitenancy in which users can share a lot of resources. To reduce the penetration by unauthorised access to the cloud and recovering the data from backups, fuelling to high security and privacy norms. In this paper, we will discuss about the of cloud computing and how to overcome them by secure cloud architecture.

Keywords: *Cloud Computing, Smart Grid Computing, Data Breaches, Vulnerable attacks, Cloud Sandbox*

OASO124

PROSPECTIVE WIRELESS COMMUNICATION

Rajeshwari.V¹, Rekha.R²

^{1,2}Adhiyamaan College of Engineering, Hosur
Email: ramyarajela531999@gmail.com

Abstract

Since from the birth of wireless communication is in 1880's itself by the scientist M.G Marconi. Then furious growth has made in wireless communication. Now a days wireless communication play a vital role in the world, peoples are being connected each other without the bunch of wires. It is freedom from wires now. This make environment stay connected, flexibility to connect multiple devices. So, communication can reach when wiring is infeasible anywhere and anytime wireless communication brings huge benefit for user as well as users has become must. Wireless communication has many applications like cellular telephone (phone), security system, Wi -Fi etc. With the rapid development of wireless communication technology, fourth generation Wireless system (4G) technology has undoubtedly become hot topic. New technologies in wireless communication were developing to fulfil the demand of current environment. Wireless communication stands for the slogan "always stay connected". Wireless communication is a "Auto magical "instantaneous communication without the any physical setup.

Keywords: *wireless, connectivity, Developing technology, Accusable, Auto magical*

WWTO102

**EFFECT OF BISPHENOL A IN DRINKING OF WATER ON
INFERTILITY**

Anantharam.V¹, Ajithkumar.N²

^{1,2}UG Student, Department of Chemical Engineering, Sri Venkateswara College of
Engineering, Sriperumbudur, Tamilnadu 602117.

Email: ananthvenkat2000@gmail.com, ajithkumarnspider@gmail.com

Abstract

Bisphenol- A is an organic synthetic compound. This is the starting material for synthesis of plastic, it used to harden plastic and to keep bacteria from growing food. BPA will easily soluble in water in 21.5 degree Celsius, due to this property this has the larger ill effects in human body. These materials get in to our body through eating and drinking of foods heated in plastics. In this paper, we present the studies on hormonal changes due to increase in content of BPA in human body. The effect of increase in concentration of BPA on drinking water. Various testing methods were investigated to find the BPA concentration in human body (that is. urinal test).

Keywords: Bisphenol-A, Hormonal Changes, poly carbonate

WWTO103

**INDUSTRIAL WASTEWATER TREATMENT METHODOLOGIES
RECYCLING AND REUSE**

G.Vignesh¹, T.Ammulu²

^{1,2}Second year MCA, Pmc tech engg-Hosur

Email: vigneshvinesh0726@gmail.com, ammulumurali283@gmail.com

Abstract

Advance physicochemistry for treat factories water, wastewater ways and more than once, subordinate and geology discuss in detail. Branch of knowledge concerned with the production perspective of water Management current insights into existing methodologies' coagulation Adsorption ion exchange, oxidation, and membrane separations that can help in understanding the accessible processes as well as their intensification for improved performance and economics are highlighted. The development area guardian cavitation, mostly in equipment design and process development along with integration with other methods, is examine in detail, area of factory wastewater surgery reprocesses and more than once practicing chemistry surroundings developments in the area of industrial wastewater.

Keywords: water, waste, chemistry, methodologies, management



Department of Chemical Engineering,
 Kongu Engineering College,
 Perundurai, Erode - 638060, India.

